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## SOME SPONGES OF LOWER CALIFORNIA (MEXICO)

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The sponges of the west coast of Mexico have been very little studied. Wilson (1904, *Memoirs of the Museum of Comparative Zoölogy of Harvard*, XXX, No. 1) described collections made by the Steamer 'Albatross' in that general region, but chiefly rather far from land and in very deep water. For comparison with species of nearby coasts, only shallow water species have zoögeographical interest, because the sponges of deep water are highly modified for their environment and appear to enjoy very wide distribution. From the comparative lack of barriers on the sea floor and the uniformity of conditions there, this wide distribution is to be expected. In contrast, great ecological differences appear as one proceeds along a coast. To what extent do sponges spread along the littoral zone?

For approximately eight years I have been making a careful study of the sponges of California, particularly in connection with my treatise thereon published in the *Proceedings of the U. S. National Museum* (1932, No. 2927). It has since seemed desirable to acquire information as to the extent to which the ranges of the California species extend southward, but several personal trips into Mexican territory failed to yield suitable grounds for collecting sponges. After inquiry it appeared that The American Museum of Natural History in New York had in its possession a very interesting collection from Lower California, that is to say, Mexico, obtained by the Steamer 'Albatross' in 1911. Through the courtesy of Dr. Roy W. Miner and other officials of the American Museum, I have been permitted to study this collection, and I wish to express to them my appreciation for courtesies and assistance rendered in this regard.

Little comparison can be made with the Porifera of the west coast of South America, because the sponges of that region are probably the least studied of any in the world. The present collection consists chiefly of sponges manifesting one or the other of two types of relationships; either to those from the north of them in California, or to sponges of the Indo-Australian region. A few are quite novel, perhaps confined to the

immediate locality. Further remarks on this subject will be made in connection with the descriptions which follow.

The type specimens of all the new forms described below are deposited in The American Museum of Natural History, New York City.

#### NEW FORMS DESCRIBED

One new genus, *Hypsispongia*, is established, and eight new species and one new variety are described, as follows:

- Lissodendoryx laxa*, new species
- Asbestopluma biserialis*, variety *californiana*, new variety
- Oxymycale paradoxa*, new species
- Hypsispongia popana*, new genus, new species
- Axinella mexicana*, new species
- Drarmacidon ophisclera*, new species
- Aptos vannamei*, new species
- Laxosuberites mexicensis*, new species
- Choanites mineri*, new species.

#### **Leucetta losangelensis** (de Laubenfels)

*Leuconia losangelensis* DE LAUBENFELS, 1930, Stanford Univ. Bull., (5) V, No. 98, p. 25.

*Leucetta losangelensis* DE LAUBENFELS, 1932, Proc. U. S. Nat. Mus., No. 2927, LXXXI, Art. 4, p. 13.

In this, as in other specimens of the collection, the label merely indicates Lower California, in this case adding, "on oyster shells," no more precise locality being given. The Lower California specimen under discussion is very like the numerous specimens from upper California, except for a somewhat greater abundance of oscules and the corresponding cloacal cavities leading to the oscules.

#### **Haliclona ecbasis** de Laubenfels

*Haliclona ecbasis* DE LAUBENFELS, 1930, Stanford Univ. Bull., (5) V, No. 98, p. 28.

This species was described from upper California. The specimen from Mexican waters is somewhat macerated, but in so far as it can be studied, it shows no significant point of difference from previously described sponges of this species.

#### **Xestospongia vanilla** (de Laubenfels)

*Haliclona vanilla* DE LAUBENFELS, 1930, Stanford Univ. Bull., (5) V, No. 98, p. 28.

*Xestospongia vanilla* DE LAUBENFELS, 1932, Proc. U. S. Nat. Mus., No. 2927, LXXXI, Art 4, p. 116.

The specimen thus identified shows considerably more vertical growth than is common in specimens from upper California and somewhat greater abundance of larger oscules with more conspicuously developed rims about them. This is probably a reaction to current or the lack thereof, and is scarcely to be regarded as significant. This interesting species extends as far north as Puget Sound, according to my personal observation. It is to be regarded as a type of sponge very characteristic of the west coast of North America and is apparently little if at all represented by any very close relatives in other parts of the world.

***Lissodendoryx laxa*, new species**

Figure 3

The holotype of this species is a small amorphous sponge about 2 by 2.5 by 2.5 cm.; another rather similar specimen occurs in the collection, presumably from a similar locality. The color as preserved in alcohol is a grayish drab; the consistency is very soft and compressible. The surface is somewhat uneven, but not especially rough or hispid. There is a very evident dermal membrane, though not readily detachable, because of its excessive thinness. In it the spicules vary from an erect position to one of being strewn in confusion. Pores and oscules cannot be made out with certainty. The endosomal structure is to be described as felted, but with strands, mostly parallel to each other, running perpendicularly to the surface. These are vaguely plumose and apparently contain some spongin. A diameter of approximately 100  $\mu$  might be assigned to them, although their outlines are so indefinite that this is only approximate. The special dermal spicules are tornotes which may be described as strongyles with unequal ends. Some of them have slight swellings at each end so that they approach the tylote condition. A characteristic size may be given as 9  $\mu$  by 600  $\mu$ . The endosomal spicules are tylostyles 17  $\mu$  by 700  $\mu$ . A very few of them have a few low spines on the heads. Apparently the microscleres consist exclusively of exceedingly abundant chelas, probably to be regarded as arcuate, although they approach closely the type known as palmate. Their length is about 50  $\mu$ .

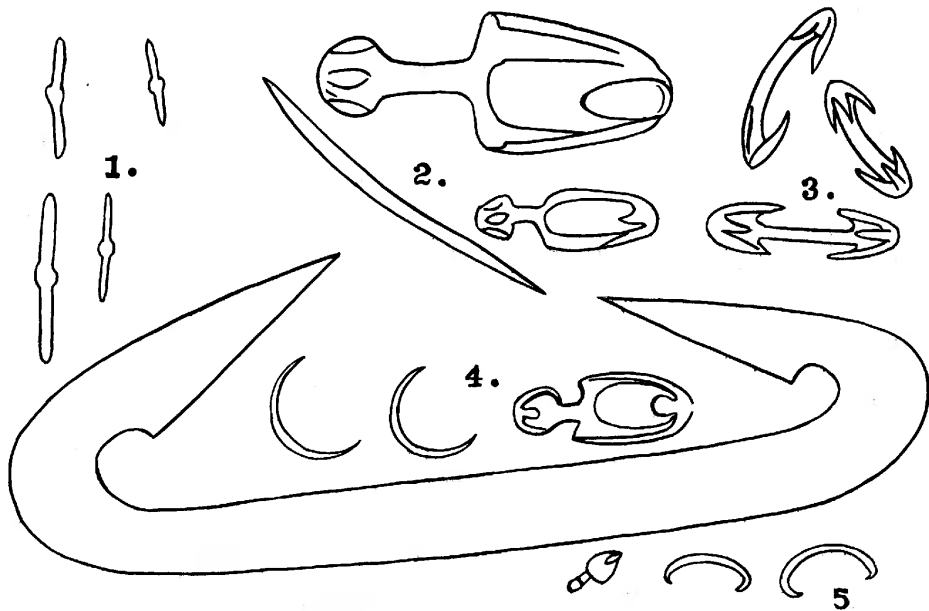
This species is remarkable for the tylostylote nature of the principal spicules and the lack of sigmas. Probably its closest relative is *Lissodendoryx balanophilus* Annandale (1914, p. 155) from India. This has smaller spicules all around and does have sigmas. Another sponge worthy of comparison here is *Lissodendoryx simplex* Topsent (1904, p. 173) a sponge from the Azores. It is very similar except that the principal spicules are simple styles instead of being tylostyles, and the chelas have a slightly different shape.

Type in The American Museum of Natural History, Cat. No. 243

**Acarus erithacus** de Laubenfels

*Acarus erithacus* DE LAUBENFELS, 1927, Ann. Mag. Nat. Hist., (9) XIX, p. 258.

This interesting sponge is moderately common in upper California, so that it is not astonishing to find it occurring down into Mexican waters. The specimen under consideration is quite typical, having not only the so-called "palm-tree" spicules, but the "rose-stem" variety as well.



Figs. 1 to 5. Microscleres, from camera lucida drawings,  $\times 666$ .

1. Four centrotylote microstrongyles of *Choanites mineri*. 2. Larger and smaller anisochelas and microxea of *Ozymycale paradoxa*. 3. Three views of isochelas of *Lissodendoryx laxa*. 4. Anisochela, sigmas and very large diancistra of *Hypsispongia popana*. 5. Two sigmas and anisochela of *Asbestopluma biserialis* variety *californiana*.

**Asbestopluma biserialis** variety **californiana**, new variety

## Figure 5

This species was first described by Ridley and Dendy (1886, Ann. Mag. Nat. Hist., (5) XVIII) as *Esperella biserialis*, from the south Pacific Ocean.

The specimen now under discussion has the "test tube cleaner" shape so distinctive of Ridley and Dendy's specimens. It is up to 14 mm. in diameter and at least 20 cm. long. It may have been longer before being broken by the collecting dredge. Its principal spicules are about  $18\ \mu$  by  $1150\ \mu$ ; its sigmas  $22\ \mu$  in chord length; and its anisochelas only  $6\ \mu$  long. This latter is the most conspicuous point of difference between the variety and the original species, which has anisochelas of twice or more the length of those in the Mexican form.

Type in The American Museum of Natural History, Cat. No. 250.

**Oxymycale paradoxa**, new species

## Figure 2

This specimen is a more or less amorphous mass, about 3 by 3 by 6 cm., and, judging from the specimen, it is not certain that it was attached at the time of collection; it may have been a so-called "roller" or loose sponge. The color, as preserved in alcohol, is pale drab, and the consistency is very spongy. The surface is rather uneven but not pronouncedly hispid. It is abundantly provided with openings about 1.2 mm. in diameter, or somewhat less. Which openings are inhalant and which exhalant is not readily made out. The interior is somewhat breadlike, very cavernous, the caverns being in the neighborhood of 1 mm. in diameter. The principal spicules are oxeas approximately  $16\ \mu$  by  $900\ \mu$ . Very many are broken, and these doubtless include the largest ones; the maximum length therefore may have been considerably more than 1 mm. Among them are very few styles, somewhat smaller, about  $10\ \mu$  by  $420\ \mu$ . The microscleres are extraordinarily abundant in number and variety. There are oxeote raphids about  $4\ \mu$  by  $110\ \mu$ . There are a few sigmas about  $30\ \mu$  in length of chord. There are some small palmate anisochelas  $35\ \mu$  long, and very conspicuous large palmate anisochelas, some about  $54\ \mu$  long, others as much as  $120\ \mu$  long, the larger ones usually being aggregated into so-called rosettes.

The combination of monaxon principal spicules as in *Mycale* with diactines as in *Oxymycale* is a puzzling and perplexing situation. It is conceivable that one might establish a new genus for this form, but it hardly seems warranted. The oxeas are so clearly the predominant form, and it is so possible that the styles are malformed young spicules, that it is far from certain that this indicates any relationship of more than the most casual nature between *Oxymycale* and *Mycale*. The former genus is clearly indicated, although this is obviously a new species, with no very close relatives. The other form at present in *Oxymycale* was originally described as *Esperia intermedia* by Schmidt (1874, *Zweite deutsche Nordpolarfahrt*, p. 433). It has only oxeas as principal spicules, has only anisochelas for microscleres, and is an arctic species.

Type in The American Museum of Natural History, Cat. No. 251.

**Hypsispongia**, new genus

This genus is established here for a species of the family Ophlitaspongiidae, having monaxon principal spicules and microscleres comprising palmate anisochelas together with diancistras. It happens that the one specimen so far described also possesses sigmas. The genotype will of course be this new species *Hypsispongia popana*.

**Hypsispongia popana**, new species

## Figure 4

The holotype is an amorphous mass about 3 by 8 by 11 cm. It is pale drab in color and very spongy in consistency. Its surface is comparatively smooth and even,

but there are meandering depressions to be made out. There is a very easily detachable special dermal structure over large subdermal cavities. This ectosome contains tangentially arranged spicules. The abundant surface apertures are approximately  $120\ \mu$  in diameter and about  $400\ \mu$  apart. Which, if any, are exhalant cannot be determined. The interior structure is somewhat "crumb-of-bread," that is to say, cavernous on a small scale. There are fibers which can be made out, but they are very confused as to pattern, and it can scarcely be said that there is any reticulation present. The approximate size of these fibers may be given as  $100\ \mu$  diameter. They contain exceedingly numerous rows of spicules, and only dubious spongin. There is no special dermal category of spicules, the same kind being found in the ectosome as in the endosome. This sort is a hastately pointed style, varying from about  $13\ \mu$  by  $550\ \mu$  in  $12\ \mu$  by  $600\ \mu$ . Among the most conspicuous spicules are the large diancistras. They do not have any considerable amount of alae as do those of some other sponges that have diancistras; their size is up to  $250\ \mu$  long. There are enormously abundant thin sigmas, about  $25\ \mu$  in chord length, frequently arranged in bundles resembling trichodragmas. There are very abundant palmate anisochelas about  $40\ \mu$  long, and others also fairly common and of similar shape but more than twice as large, say  $85\ \mu$  in length, which latter are arranged in rosettes.

In addition to the holotype (American Museum of Natural History, Cat. No. 262), there is a second rather similar specimen in the collection. The combination of diancistras with palmate anisochelas is quite peculiar and constitutes the most distinguishing mark of the genus and species.

#### **Hemectyon hyle** de Laubenfels

*Hemectyon hyle* DE LAUBENFELS, 1930, Stanford Univ. Bull., (5) V, No. 98, p. 28.

Very much like the specimen previously described from upper California, this also is a fantastically irregular subramose sponge. It closely agrees in other ways with the previously described specimen.

#### **Axinella mexicana**, new species

##### Figure 6

The holotype is a thinly encrusting mass, about 1 by 1 by 2 cm. in dimensions. The color is drab, and the consistency is between spongy and fragile, so much so that it breaks and tears with very great ease. As to surface structures, it resembles *Acarinus erithacus* (above mentioned) in that to the naked eye there are evidently great masses of plumose ascending columns, all of approximately the same height. Looking down upon such a sponge with a magnifying glass is very like seeing a coniferous forest from the air. The pores are to be interpreted as represented by the interstices between the treelike columns. There are obvious oscules, about one per square centimeter, and each about 1 mm. in diameter. The internal structure has already been described above in the comparison to a pine forest. The plumose fibers are slightly more than  $150\ \mu$  in diameter. The principal spicules are monaxons, usually about  $20\ \mu$  by  $300\ \mu$ , but rather frequently reaching  $24\ \mu$  by  $400\ \mu$ . It is characteristic of these that they are sharply bent at a point about one-fifth of the total length of the spicule away from the blunt end. Among them are oxeas, almost

as numerous, usually about  $27\ \mu$  by  $560\ \mu$ , although occasionally smaller, say only  $16\ \mu$  by  $400\ \mu$ . These are about almost invariably bent at approximately the midpoint of the spicule.

Probably the most remarkable thing about this species is the fact that the oxeote spicules exceed in size the stylote. However, there are at least two other species in the genus *Axinella* of which this is true. *Axinella sanguinea* described from South Africa by Burton (1933, p. 253) has this characteristic, but its spicules are very much smaller than those of the Mexican form at present under discussion. The oxeas are only  $11\ \mu$  by  $211\ \mu$ , and the styles only  $7\ \mu$  by  $140\ \mu$ . Another sponge having this unusual characteristic was described from the Azores as *Axinella vasonuda* by Topsent (1904, p. 140). Its spicules are enormously larger than those of the Mexican form, the oxeas being  $50\ \mu$  by  $1500\ \mu$  and the styles  $20\ \mu$  by  $1000\ \mu$ . Another *Axinella* that is probably even closer than either of these two is that which was first described by Esper (1794, p. 275) as *Spongia verrucosa*. Its styles and oxeas are almost exactly the size and shape of the Lower Californian sponge, although the styles tend to be larger and the oxeas smaller, but in addition to them it possesses strongyles, is ramose, and has a very pronouncedly verrucose surface. Since the form under discussion lacks all three of the characteristics last mentioned, it seems advisable at present to establish a new species for it.

Type in The American Museum of Natural History, Cat. No. 261.

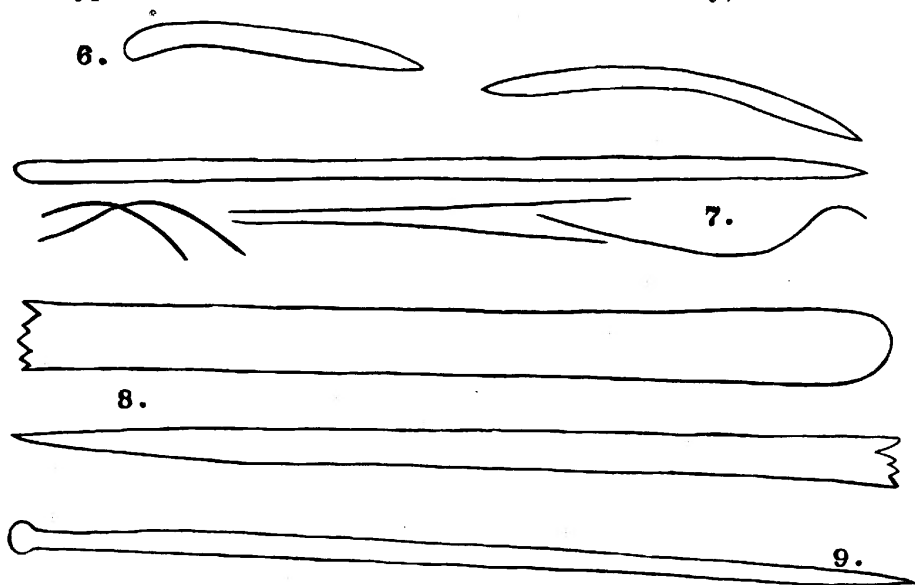
#### ***Drarmacidon ophisclera*, new species**

##### Figure 7

The holotype of this species is flat above, convex below, about 2 cm. thick, and its lateral dimensions are approximately 5 by 7 cm. It is pale drab in color as preserved in alcohol, and very spongy in consistency. The surface is rather smooth and even, and shows a clearly demarked special dermal membrane. Microscopic study reveals that this is packed with spicules chiefly erect, that is to say, perpendicular to the surface. The pores and oscules cannot be made out with certainty. The internal structure shows obvious fibers in rather confused reticulation. These tracts or fibers are about  $150\ \mu$  in diameter. The commonest type of spicule present is the style,  $25\ \mu$  by  $1200\ \mu$ , but very many of the spicules are oxeote in shape, and these, although almost as thick as the styles, are remarkably shorter, say  $23\ \mu$  by  $650\ \mu$  only. Among these larger spicules are enormous numbers of very thin spicules occasionally straight, but more often sinuously bent, each having several rounded undulations. The variation in length is enormous. The thickness of each is approximately  $1\ \mu$  only.  $150\ \mu$  might be cited as an average length, but certainly the variation is at least as great as from  $50\ \mu$  to  $500\ \mu$ . Perhaps most or all have been broken since collection or even before that time, during the life of the sponge. Occasionally these are arranged in bundles as are the spicules referred to as trichodragmas.

It is the presence of these peculiar serpent-shaped thin spicules that sets off the present species sharply from all others. There are no close relatives, and in fact it is conceivable that a new genus might be erected for this form, but otherwise the relationship to the genus *Drasmodon* is sufficiently close to make such a step unwarranted at present.

Type in The American Museum of Natural History, Cat. No. 260.



Figs. 6 to 9. Megascleres, from camera lucida drawings,  $\times 150$ .

6. Style (at left) and oxea (upper right) of *Arinella mexicana*. 7. Style (above) and five raphides of *Drasmodon ophisclera*. 8. Head of style (above) and pointed end of style (below) of *Aaptos vannamei*. 9. Tylostyle of *Laxosuberites mexicensis*.

### ***Aaptos vannamei*, new species**

#### Figure 8

The holotype of this is a symmetrical sponge with a base about 2 by 7 cm. and an altitude of about 4.5 cm. There is nothing distinctive either as to its color or consistency, it being moderately compressible and easily torn. There is a distinct cortex about  $800\mu$  thick containing so many and such pronouncedly erect spicules that the surface is to be described as hispid. Many of the above-mentioned spicules protrude as much as 4 mm. from the surface. The pores cannot be made out with certainty, but the exhalant aperture is quite remarkable. In general the sponge may be described by comparison with a cone or miniature volcanic mountain. If it be placed with the apex upward, the spicules that hispidate the surface will be found to point directly away from the substratum rather than perpendicular to the slanting slopes of the hill. At the apex there is a crater about 1 cm. in diameter which does not possess hispidating spicules of large size, although with a microscope it is found to be packed with erect spicules of very small size. It is in general concave in shape, but near its center there rises a second little cone only 2 or 3 mm. high, the walls of which are



chiefly protoplasmic or fleshy. This ascends to the oscule proper, which has a diameter in the preserved specimen of barely 1 mm., but presumably might be opened to a greater size in life. From it a cloacal chamber extends downward into the sponge with smaller and smaller branches until it is dissipated throughout the internal structures. There are two distinct categories of spicules present. First there are very abundant thin styles or subtylostyles, all approximately  $5\ \mu$  in diameter and varying considerably in length;  $500\ \mu$  to  $600\ \mu$  may be cited as representative of the latter dimension. The other category is of styles varying from  $60\ \mu$  by  $3600\ \mu$  to at least  $120\ \mu$  by even greater length. The longest are usually broken, but it may safely be assumed that they exceeded 5 or 6 mm. before being damaged.

The very noteworthy external form of this sponge is perhaps that which distinguishes it most satisfactorily from all others. The type of the genus, originally described as *Ancorina aaptos* by Schmidt (1864, p. 33), from the Mediterranean, had both its categories of styles considerably smaller than those of the Mexican species at present under consideration.

The species is named for the eminent zoölogist, Dr. W. G. Van Name, of The American Museum of Natural History, New York City.

Type in The American Museum of Natural History, Cat. No. 255.

#### ***Laxosuberites mexicensis*, new species**

##### Figure 9

The holotype of this species encrusts an enormous spicule from a sponge of the class Hyalospongiae (Hexactinellidae), which spicule is more than 1 mm. thick, and more than 150 mm. long. The encrustation is not spread uniformly along this spicule, however, but is wedge-shaped, or triangular, extending in one place more than 1 cm. away from the hexactinellid spicule, and at the greatest being less than 2 cm. in dimensions parallel to said spicule. Its color is drab; its consistency soft; the surface is minutely hispid; pores and oscules cannot be made out with certainty. The internal structure is in general rather confused, but right at the surface there are bouquets of spicules with the points toward the surface. These are not, however, conspicuously smaller than those of the endosome, but instead all the megascleres may be quoted as of but a single size range, namely, approximately  $20\ \mu$  by  $1000\ \mu$ . They are all tylostyles.

The structure is clearly that of *Laxosuberites*, but it is interesting to note that the sponge in other respects most like the one under discussion is a member of the genus *Prosuberites*, described from the Mediterranean as *Prosuberites longispina* by Topsent (1894, p. xlii). In upper California there is recorded by de Laubenfels (1930 p. 26) a sponge under the name of *Prosuberites sisyrnus*; this, however, bears only slight resemblance to the Mexican form under discussion, for example, having its tylostyles only  $8\ \mu$  by  $27\ \mu$  to  $20\ \mu$  by  $480\ \mu$ . The combination of relatively enormous spicules in the *Laxosuberites* type of structure is perhaps the most

characteristic item in regard to the sponge at present under discussion.

Type in The American Museum of Natural History, Cat. No. 242.

***Suberites durissimus* Ridley and Dendy**

*Suberites durissimus* RIDLEY AND DENDY, 1886, Ann. Mag. Nat. Hist., (5) VIII, p. 486.

This species was described from Australia. The form under discussion at the present time bears no distinctive point of separation from the Australian form but may be described briefly for purposes of comparison, if such seems necessary.

It is subspherical, about 1 cm. in diameter, drab, toughly compressible, having an even surface, which is lipostomous. The internal structure is between radiate and semiplumose. The special dermal tylostyles are approximately  $4\ \mu$  by  $300\ \mu$  and the endosomal ones  $18\ \mu$  by  $1200\ \mu$ . Some sand with other foreign material is present.

***Choanites mineri*, new species**

Figure 1

This interesting sponge has the shape of a shallow cup, about 4 by 8 cm., with walls 2 cm. thick, and the depression only a little over 1 cm. deep. Perhaps the comparison should rather be made to a saucer than to a cup. The color is drab and the consistency firm, almost cartilaginous, easily cut. There is an evident ectosomal specialization about  $180\ \mu$  thick which might perhaps be called a cortex. The surface is very even, but with a microscope is seen to be packed with erect spicules. The surface is abundantly provided with openings about only  $50\ \mu$  in diameter and about  $110\ \mu$  apart, center to center. Which of these openings, if any, are to be described as oscules, is not apparent. The internal structure is astonishingly free from any semblance of radiate architecture; instead it is more like that of "crumb-of-bread." There are abundant canals about  $100\ \mu$  in diameter or gross chambers of the same size. These cavities are so abundant that they are only  $250\ \mu$  apart, center to center. The arrangement of the spicules is restricted to inclusion in the relatively small amount of flesh about these canals and chambers. In the protoplasmic walls they are arranged more or less in confusion. The megascleres are of one sort only—tylostyles—approximately  $10\ \mu$  by  $340\ \mu$ , the erect dermal ones being of the same size as those in the endosome. Among them is an abundance of microscleres, which abundance is very uncommon in the order Hadromerina. These are quite typical of the genus *Choanites*, being centrotylote microstrongyles. The typical size is  $2\ \mu$  by  $30\ \mu$ ; some are as small as  $1\ \mu$  by  $18\ \mu$ , and a few as large as  $3\ \mu$  by  $36\ \mu$ .

This is a very decisively characterized species apparently having no close relatives at present described, and possibly even deserving of a new genus. The fact that the ectosomal spicules are the same size as those in the endosome is distinctly different from what would be expected in typical *Choanites*. The lack of radiate structure and the great abundance of the microscleres has already been thought worthy of comment above, and the fact that these microscleres are frequently curved is not at all common.

This species is named for the eminent zoölogist, Dr. R. W. Miner, of The American Museum of Natural History, New York City.

Type in The American Museum of Natural History, Cat. No. 248.

***Tethya aurantia* (Pallas)**

*Alcyonium aurantium* PALLAS, 1766, 'Elenchus Zoophytorum,' p. 210.

*Tethya aurantia* TOPSENT, 1900, Arch. Zool. Exp., (3) VIII, p. 294.

This species has already been recorded by numerous authors from practically every part of the world, and for this reason it is not astonishing to find it in Lower California. It has previously been recorded from upper California by de Laubenfels (1932, p. 44). The specimen from Mexican waters differs in no important respect from those found in upper California, and, for that matter, in other parts of the world.

***Topsentia glabra* (Topsent)**

*Anisoxya glabra* TOPSENT, 1898, Mém. Soc. Zool. France, XI, p. 234.

*Topsentia glabra* BERG, 1899, III, Comm. Mus. Nac. Buenos Aires, I, pp. 77-80.

This species was described from the Azores and later made type of the genus *Topsentia*. It is rather unexpected that the sponge from the west coast of North America should have its closest relative in the Azores, so a very brief description of the Mexican sponge is here appended.

It is lamellate, about 1 cm. thick and 8 cm. square. The color is pale drab, and the consistency is friable to stony. The surface is minutely hispid, well provided with apertures up to 1 mm. in diameter, some of which are probably oscules and others pores. The megascleres are large oxeas  $16\ \mu$  by  $530\ \mu$  to  $19\ \mu$  by  $940\ \mu$ , among which are found microxea only  $4\ \mu$  by  $105\ \mu$ .

This does not differ in any significant respect from the previously described Atlantic species. It does not even seem advisable at present to erect a subspecies for it.

***Tetilla mutabilis* de Laubenfels**

*Tetilla mutabilis* DE LAUBENFELS, 1930, Stanford Univ. Bull., (5) V, No. 98, p. 26.

This was originally described from upper California. There is no significant point of difference between the Californian species and the Mexican one at present under discussion, except that the latter has a shape that is not the most common farther north. It is cone-shaped, the apex evidently having been upmost, and the base affixed in sand.

**Craniella arb** (de Laubenfels)

*Tetilla arb* DE LAUBENFELS, 1930, Stanford Univ. Bull., (5) V, No. 98, p. 26.

There is no considerable amount of difference between the specimen previously described from upper California and this one herein recorded from Lower California.

**Craniella dactyloidea** (Carter)

*Tethya dactyloidea* CARTER, 1869, Ann. Mag. Nat. Hist., (4) III, p. 15.

This sponge was originally described from Arabia. It has since been recorded from the Philippine Islands by Wilson (1925, p. 358). Its distribution is perhaps circumequatorial, because this example from the west coast of North America differs in no striking way from the Philippine and Indian Ocean specimens.

It is an erect cylinder, 4 mm. in maximum diameter, 16 mm. high, with one apically placed oscule or cloaca. There are abundant, very long, usually broken oxeas  $4\ \mu$  in diameter, and some protiaenes of the same size range. There are very thin oxeote spicules less than  $1\ \mu$  in diameter, slightly more than  $100\ \mu$  long, and small sigmoid spicules less than  $1\ \mu$  thick, and  $10\ \mu$  in chord length.

**Pachastrella monilifera** Schmidt

*Pachastrella monilifera* SCHMIDT, 1868, 'Die Spongien der Küste von Algier,' p. 15.

This species is already well known to be cosmopolitan, so there is nothing surprising in its discovery on the Pacific coast of North America.

It was originally described from the Mediterranean, and the original description might do well for the specimen in the collection at present being studied.

**Chondrilla nucula** Schmidt

*Chondrilla nucula* SCHMIDT, 1862, 'Die Spongien des adriatischen Meeres,' p. 39.

This species was originally described from Europe. Wilson (1902, p. 386) recorded it from the West Indies, and Burton (1924, p. 206), from Australia. It also is probably circumequatorial in distribution, as this Mexican record would seem to indicate.

This is a fleshy encrusting sponge about 1 cc. in volume, 1 sq. cm. in area, and 2 or 3 cm. thick, dark drab in color and cartilaginous in consistency, smooth even surface, lipostomous, aspiculous.

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